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OBSERVED MEAN MONTHLY WINDS AT STANDARD PRESSURE SURFACES FROM --ETC(U)
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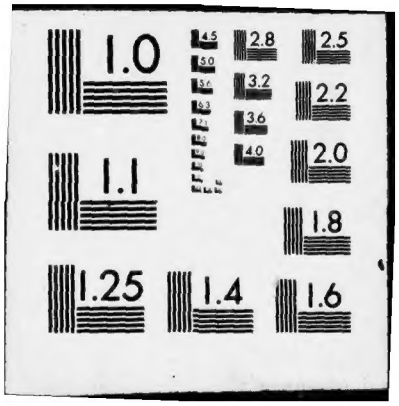
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OBSERVED MEAN MONTHLY WINDS AT STANDARD PRESSURE SURFACES FROM 850 MB TO 100 MB

AIR FORCE GEOPHYSICS LABORATORY
HANSCOM AIR FORCE BASE, MASSACHUSETTS

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Observed Mean Monthly Winds at Standard Pressure Surfaces From 850 mb to 100 mb

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30 September 1976

METEOROLOGY DIVISION PROJECT 8624
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This technical report has been reviewed and is approved for publication.

FOR THE COMMANDER:

John Howard

Chief Scientist

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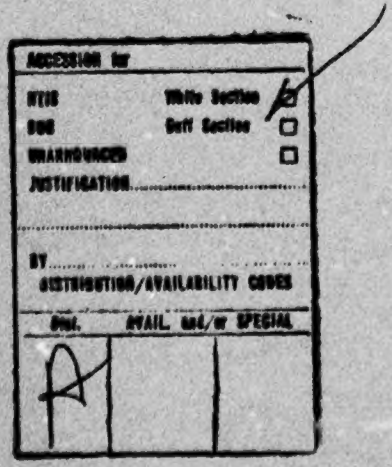

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This paper contains tables of mean monthly east-west and north-south wind components for January, April, July, and October at 200 Northern Hemisphere locations. The information provided herein is considered to be the best climatic mean monthly wind data currently available for these locations. However, it does not completely satisfy the need for an up-to-date wind atlas.

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Contents

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Tables

Observed Mean Monthly Winds at Standard Pressure Surfaces From 850 mb to 100 mb

1. INTRODUCTION

This paper contains mean east-west (zonal) and north-south (meridional) wind components for the seven standard pressure surfaces between 850 mb and 100 mb at 200 Northern Hemisphere rawinsonde stations. The wind components are based on at least 8 years of rawinsonde observations taken during the 10-year period from January 1964 through December 1973. Values were summarized from the publication Monthly Climatic Data for the World,[1] which contains mean monthly vector winds based on daily rawinsonde observations. For most stations, less than 10 percent of the daily observations are missing. No attempt was made to estimate any bias that may be introduced by the absence of these observations; however, in general, the strong wind cases are the most frequently missed observations, resulting in slightly smaller computed mean values than the true means. Because observing equipment has improved in recent years, fewer observations are missed now than prior to 1964.

(Received for publication 29 September 1970)

1. NOAA (1964-1974) Monthly Climatic Data for the World, January 1964-December 1973, U.S. Government Printing Office.

The climatic mean wind components provided in this paper were originally calculated for use in comparing observed and computer-deduced mean monthly winds.[2] This comparison led to the conclusion that winds based on daily rawinsonde observations provided better estimates of true climatic winds than the computer-generated values. This conclusion and the fact that one of the most highly regarded wind atlases available today is more than 17 years old,[3] has prompted publication of these tables.

These tables are based on at least 8 years of observations taken since 1964 and are considered to be good estimates of the true climatic winds. On the other hand, the charts in Crutcher's atlas[3] are based on observations taken between 1944 and early 1958. At that time, only 4 years of upper-air data were available for many locations. Consequently, a new atlas based on more recent observations is needed.

2. OBSERVED VS "ATLAS" WINDS

Mean seasonal "atlas" winds obtained from reference 3 were compared with the observed climatic winds published in this report for a number of Northern Hemisphere stations ranging in latitude from 14°N to 80°N. Winter (December, January, and February) and summer (June, July, and August) zonal and meridional winds for six of these stations are shown in Table 1 for six standard pressure levels, 850 through 100 mb. Speeds are in knots, and positive values represent winds from the west and south.

Values shown for the two methods are in general agreement. However, differences at some locations, levels, and seasons are significant, notably at the higher altitudes and speeds. For example, winter zonal winds for 200 and 300 mb at Kagoshima, Japan, and for 100 to 300 mb at Lihue, Kauai, Hawaii, do not compare well, in that observed winds are considerably larger than "atlas" values (see Table 1). At least a portion of these discrepancies is a result of the fact that "atlas" winds at the six stations shown are based on only 5 to 6 years of data, whereas the observed climatic winds are based on 10 years (9 years at Jan Mayen). Furthermore, the "atlas" winds were taken from data roughly 15 years older than that for the climatic winds in this paper; hence, the actual period of record at the higher pressure altitudes is for even fewer years than indicated in both Crutcher's atlas and Table 1. Much of the missing data at the higher altitudes was undoubtedly

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2. Kantor, A.J. (1976) A Comparison Between Observed and Deduced Mean Monthly Winds from 700 mb to 200 mb, ERP No. 548, AFCRL-TR-76-0044.

3. Crutcher, H.L. (1959) Upper Wind Statistics Charts of the Northern Hemisphere, NAVAER 50-1C-535, Volumes I and II.

due to strong winds aloft in winter that severely affected the older rawinsonde tracking equipment. Consequently, the resulting bias toward lighter winds (at the higher levels) is greater in the earlier "atlas" data.

3. MEAN MONTHLY OBSERVED WINDS

Climatic mean monthly observed winds are provided in Table 2 for the 200 Northern Hemisphere locations shown in Figure 1. Based on at least 8 years of daily observations, as described earlier, the mean zonal and meridional winds presented in Table 2 are for the midseason months January, April, July, and October. Again, speeds are in knots, and positive values represent winds from the west and south.

4. CONCLUSIONS

The information provided in Table 2 is considered to be the best climatic mean monthly wind data currently available. Moreover, it indicates a need for the construction of an up-to-date, upper-air wind atlas that will contain scalar wind speeds, standard vector deviations, and standard deviations of zonal and meridional components.

Table 1. Comparison of "Atlas" and Observed Mean Seasonal Wind Components*

Guam (14°N, 145°E)
(Period of Record: Atlas, 3-4 yr, Observed, 10 yr)

mb	Winter				Summer			
	E/W		N/S		E/W		N/S	
	Atlas	Obs.	Atlas	Obs.	Atlas	Obs.	Atlas	Obs.
850	-15	-18	0	-2	-8	-9	3	2
700	-15	-16	2	-1	-8	-7	6	7
500	-11	-13	3	2	-10	-9	5	5
300	-5	-6	2	1	-8	-7	-1	-2
200	-4	-3	1	0	-5	-5	-3	-2
100	-10	-13	3	2	-12	-10	-8	-5

Lihue, Kauai (22°N, 160°W)
(Period of Record: Atlas, 6 yr; Observed, 10 yr)

mb	Winter				Summer			
	E/W		N/S		E/W		N/S	
	Atlas	Obs.	Atlas	Obs.	Atlas	Obs.	Atlas	Obs.
850	-7	-5	3	-1	-11	-14	-1	-4
700	-3	0	5	3	-7	-10	-2	-1
500	0	10	-7	-7	0	-1	0	0
300	21	20	-4	-4	12	6	2	0
200	23	22	-11	-11	22	21	-1	2
100	19	20	-12	-6	-1	0	4	2

Koganshima (32°N, 131°E)
(Period of Record: Atlas, 4 yr, Observed, 10 yr)

850	20	14	-4	-4	3	8	3	3
700	31	29	-4	-4	3	10	3	8
500	42	40	-1	2	13	14	3	3
300	90	117	2	7	32	33	6	3
200	150	134	1	16	29	24	4	0
100	85	84	3	0	0	6	-6	-6

Bay Delta (44°N, 83°W)
(Period of Record: Atlas, 3 yr; Observed, 10 yr)

850	17	17	0	2	13	16	3	4
700	23	23	0	0	17	20	3	3
500	32	32	11	16	26	29	3	3
300	63	66	16	16	33	34	0	1
200	66	61	17	16	31	34	-1	-2
100	27	31	0	0	17	17	1	0

Churchill (59°N, 94°W)
(Period of Record: Atlas, 3 yr, Observed, 10 yr)

850	5	7	-3	-3	7	6	-2	-4
700	12	12	-6	-7	10	10	-6	-8
500	23	24	-10	-10	16	17	-8	-11
300	28	29	-14	-13	29	26	-11	-12
200	29	30	-13	-13	31	26	-10	-11
100	26	24	-11	-13	10	9	-6	-8

Jan Mayen (71°N, 9°W)
(Period of Record: Atlas, 3 yr, Observed, 9 Yr)

850	5	3	-2	-3	3	2	0	0
700	9	9	-2	-3	5	6	1	2
500	14	12	-1	-1	8	7	1	3
300	25	24	-6	-3	10	11	3	4
200	22	20	-2	-2	9	10	3	4
100	17	13	-2	-4	2	4	5	4

*Speed in knots; winds from the west and south are positive.

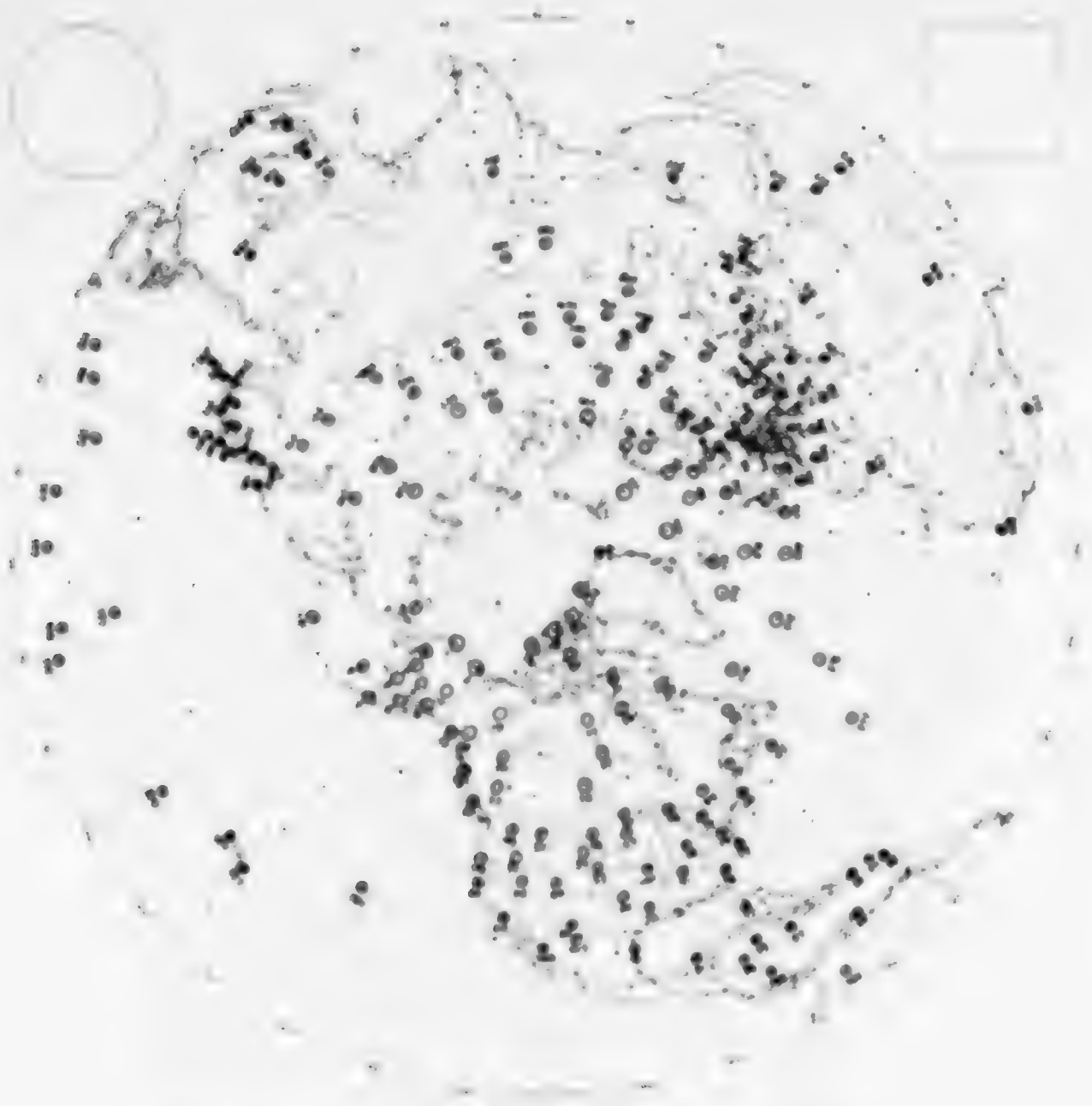

Figure 1. Locations of 200 Northern Hemisphere Rawinsonde Stations

Table 2. Climatic Mean Monthly Observed East-West and North-South Winds*

#1 Barrow (71°N, 157°W)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	-5	-1	-4	1	5	4	-3	1
700	0	-4	0	2	7	5	1	3
500	8	-5	4	3	13	6	6	8
300	17	-6	10	5	13	5	12	12
200	21	-3	11	6	10	2	14	10
150	25	-2	11	7	6	0	15	9
100	33	-3	11	8	2	0	17	9

#2 Barter (70°N, 144°W)

850	3	-1	-1	1	7	2	0	1
700	3	-4	3	2	10	3	4	3
500	8	-8	10	2	12	4	11	7
300	17	-12	18	5	17	5	20	11
200	21	-9	16	4	12	2	20	10
150	25	-9	15	4	8	1	21	9
100	32	-10	14	4	4	0	21	8

#3 Kotzbue (67°N, 163°W)

850	-4	2	-2	3	3	6	-2	3
700	1	0	0	5	4	8	1	5
500	9	1	4	8	6	8	5	8
300	19	4	11	10	10	6	10	13
200	22	6	14	9	8	3	12	10
150	24	7	15	10	6	2	15	10
100	31	9	14	10	2	2	17	10

#4 Nome (64°N, 165°W)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	-3	3	-2	2	1	7	0	2
700	2	3	2	2	2	7	4	2
500	8	4	6	3	3	6	8	4
300	16	6	14	6	6	3	14	6
200	18	8	14	7	7	1	17	7
150	22	8	13	7	5	1	17	7
100	27	9	12	9	1	1	19	7

#5 Bethel (61°N, 162°W)

850	0	0	3	5	0	8	3	0
700	4	0	5	6	0	8	6	1
500	11	5	10	7	3	7	10	4
300	18	8	20	8	10	5	20	7
200	21	9	18	8	11	2	22	7
150	23	10	17	9	8	1	21	7
100	24	9	12	8	2	1	20	7

#6 King Salmon (59°N, 157°W)

850	0	-3	2	3	0	3	2	-1
700	4	-2	7	4	2	3	6	0
500	11	-3	13	5	6	2	11	3
300	16	-2	23	3	14	-1	19	4
200	21	0	21	4	16	-2	24	4
150	22	2	19	6	11	-1	24	6
100	21	1	15	6	4	0	22	6

*Speed is in knots; winds from the west and south are positive

Table 2. Climatic Mean Monthly Observed East-West and North-South Winds[a] (Cont.)

*7 Cold Bay (55°N, 163°W)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	3	0	10	1	7	4	10	-4
700	8	0	14	2	9	4	14	-4
500	14	7	22	5	15	3	20	-1
300	20	12	28	7	24	2	29	4
200	21	11	27	5	23	-1	28	4
150	19	11	23	3	16	-1	25	4
100	17	9	15	3	7	0	24	5

*8 McGrath (62°N, 155°W)

mb								
850	-6	-4	0	4	1	6	-1	2
700	2	-1	5	7	4	7	3	5
500	8	0	7	8	3	5	6	6
300	16	-1	15	7	7	6	14	11
200	21	2	17	4	8	2	19	7
150	24	2	14	3	9	2	16	8
100	25	1	12	3	1	1	19	7

*9 Adak, Pearl (52°N, 170°W)

mb								
850	1	-4	5	0	3	5	5	-2
700	4	-3	8	1	7	4	12	-2
500	9	-5	16	2	9	3	15	-1
300	14	15	24	7	15	2	24	0
200	15	13	23	5	13	1	27	1
150	15	14	20	7	12	0	26	2
100	17	13	15	7	5	0	23	3

*10 Fairbanks (65°N, 148°W)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	-3	1	3	4	6	3	0	5
700	2	-1	6	6	6	5	5	8
500	6	-5	10	9	7	6	10	11
300	16	-8	13	10	10	7	16	14
200	22	-6	10	6	9	4	19	11
150	25	-4	15	6	6	3	19	10
100	31	-6	13	5	2	2	20	8

*11 Anchorage (61°N, 150°W)

mb								
850	-4	-3	-4	4	-2	4	-2	4
700	0	-1	0	9	-2	5	-1	9
500	8	-3	8	10	2	5	6	12
300	17	-3	19	9	6	5	16	14
200	23	-2	17	6	9	2	21	10
150	24	-1	16	6	6	2	21	9
100	23	-2	12	5	2	2	20	8

*12 Yakutat (60°N, 140°W)

mb								
850	-3	4	-3	8	-5	5	-6	11
700	1	3	1	8	-2	4	1	12
500	12	2	8	7	0	4	10	15
300	25	-6	19	3	4	3	22	12
200	25	-8	19	1	8	2	26	7
150	26	-8	16	2	7	3	25	7
100	26	-9	12	3	3	2	22	6

[a] speed is in knots; winds from the west and south are positive

Table 2. Climatic Mean Monthly Observed East-West and North-South Winds* (Cont.)

(11) Annette I. ([illegible]°N, 132°W)

mb	JAN E-W	JAN N-S	APR E-W	APR N-S	JULY E-W	JULY N-S	OCT E-W	OCT N-S
850	-1	5	1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
700	10	3	7	[illegible]	[illegible]	4	12	14
500	21	[illegible]	[illegible]	2	[illegible]	4	22	[illegible]
300	40	[illegible]	[illegible]	-7	[illegible]	4	34	[illegible]
200	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
150	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
100	[illegible]	[illegible]	[illegible]	0	[illegible]	[illegible]	[illegible]	[illegible]

(12) Mould Bay ([illegible]°N, 120°W)

mb	JAN E-W	JAN N-S	APR E-W	APR N-S	JULY E-W	JULY N-S	OCT E-W	OCT N-S
850	2	-3	2	-4	[illegible]	-2	3	-2
700	1	-10	[illegible]	[illegible]	[illegible]	-4	6	-3
500	1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	10	-4
300	4	[illegible]	12	[illegible]	20	[illegible]	18	-4
200	10	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	18	-1
150	[illegible]	[illegible]	[illegible]	-4	[illegible]	-4	18	0
100	[illegible]	[illegible]	[illegible]	-2	[illegible]	[illegible]	18	2

(13) [illegible]

mb	JAN E-W	JAN N-S	APR E-W	APR N-S	JULY E-W	JULY N-S	OCT E-W	OCT N-S
850	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
700	3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
500	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
300	[illegible]	[illegible]	[illegible]	4	[illegible]	6	[illegible]	[illegible]
200	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	6	[illegible]	[illegible]
150	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
100	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

(14) Whitehorse ([illegible]°N, [illegible]°W)

mb	JAN E-W	JAN N-S	APR E-W	APR N-S	JULY E-W	JULY N-S	OCT E-W	OCT N-S
850	[illegible]	[illegible]	[illegible]	7	[illegible]	[illegible]	-1	10
700	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	10	11
500	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	14	11
300	[illegible]	[illegible]	19	7	[illegible]	[illegible]	26	14
200	[illegible]	[illegible]	17	[illegible]	[illegible]	1	27	11
150	[illegible]	[illegible]	[illegible]	4	7	2	[illegible]	8
100	[illegible]	-20	[illegible]	4	[illegible]	2	24	6

(15) [illegible] ([illegible]°N, 104°W)

mb	JAN E-W	JAN N-S	APR E-W	APR N-S	JULY E-W	JULY N-S	OCT E-W	OCT N-S
850	0	[illegible]	[illegible]	-4	[illegible]	-2	[illegible]	0
700	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2
500	-2	[illegible]	[illegible]	[illegible]	[illegible]	-4	7	-2
300	-1	-7	[illegible]	-7	[illegible]	[illegible]	13	-1
200	2	-8	[illegible]	[illegible]	7	[illegible]	14	0
150	[illegible]	-10	[illegible]	[illegible]	4	-4	[illegible]	1
100	12	[illegible]	10	-2	1	[illegible]	16	2

(16) Norman Wells ([illegible]°N, [illegible]°W)

mb	JAN E-W	JAN N-S	APR E-W	APR N-S	JULY E-W	JULY N-S	OCT E-W	OCT N-S
850	7	-4	4	1	[illegible]	-2	[illegible]	0
700	7	[illegible]	10	0	[illegible]	[illegible]	11	0
500	14	-8	14	0	[illegible]	[illegible]	18	2
300	19	-12	21	0	[illegible]	-4	26	4
200	21	-14	18	0	14	-3	27	3
150	24	[illegible]	16	1	10	-1	25	3
100	29	-18	11	1	[illegible]	-1	24	3

*Speed is in knots; winds from the west and south are positive

Table 2. Climatic Mean Monthly Observed East-West and North-South Winds* (Cont.)

#22 Prince George (54°N, 123°W)

mb	JAN		APR		JULY		OCT	
	E W	N S	E W	N/S	E W	N/S	E/W	N/S
850	4	6	6	4	6	0	8	11
700	16	2	11	5	10	4	18	5
500	28	0	18	5	14	5	29	4
300	42	-4	29	3	21	7	43	3
200	38	-9	24	0	23	6	41	-2
150	33	-9	18	0	19	6	34	-1
100	29	-10	13	1	10	4	26	0

#24 Fort Nelson (59°N, 123°W)

850	6	-3	5	-1	5	-4	9	-2
700	12	-4	10	0	6	-2	16	-2
500	22	-5	17	3	9	0	24	1
300	35	-10	25	3	13	1	40	2
200	31	-12	21	1	14	1	41	0
150	30	-13	17	1	12	1	33	1
100	29	-15	13	0	8	1	26	1

#26 The Pas (54°N, 101°W)

850	8	-5	4	-2	6	-3	8	-5
700	15	-7	10	-5	12	-5	14	-7
500	26	-10	18	-5	20	-6	24	-9
300	37	-16	25	-2	33	-6	38	-11
200	36	-15	25	-4	35	-4	42	-9
150	34	-14	21	-2	28	-5	34	-8
100	35	-16	16	-2	16	-4	25	-5

#27 Port Hardy (51°N, 127°W)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	6	9	4	7	2	2	6	10
700	17	7	10	7	7	3	15	11
500	31	3	20	4	15	4	29	9
300	48	-1	34	-2	24	5	50	6
200	43	-5	30	-4	26	6	58	0
150	35	-7	22	-2	21	7	38	0
100	27	-7	15	-1	11	5	24	0

#28 Alert (82°N, 62°W)

850	0	-1	1	0	4	1	4	0
700	0	2	-2	2	4	2	5	1
500	1	5	-3	5	6	4	8	1
300	3	7	1	6	6	5	11	3
200	4	5	4	5	1	3	12	3
150	5	3	6	3	0	2	12	2
100	7	-1	8	1	-2	1	14	2

#29 Eureka (80°N, 86°W)

850	-2	-2	-1	0	2	2	0	1
700	-2	-1	-1	-1	4	0	2	1
500	-1	0	-1	-2	6	-1	4	2
300	0	1	1	-1	9	-4	9	3
200	0	-1	4	0	4	-2	11	2
150	4	-3	6	0	1	-1	11	2
100	6	-7	8	0	-1	-1	12	2

*Speed is in knots; winds from the west and south are positive

Table 2. Climatic Mean Monthly Observed East-West and North-South Winds* (Cont.)

#30 Resolute (75°N, 95°W)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	0	-4	2	-3	4	-4	2	0
700	0	-5	4	-6	6	-6	4	-1
500	-1	-2	6	-7	9	-7	8	-2
300	1	-2	10	-7	13	-8	15	-3
200	4	-5	10	-4	8	-7	15	-2
150	6	-7	10	-4	5	-5	15	-2
100	12	-12	10	-2	1	-3	16	-2

#31 Hall Beach (69°N, 81°W)

850	0	-2	4	-3	1	-4	2	-3
700	1	1	8	-2	3	-4	4	-2
500	3	4	14	-1	6	-5	9	-1
300	6	8	18	1	9	-6	17	-2
200	9	3	15	1	7	-4	17	-1
150	10	1	12	1	4	-3	16	-1
100	13	-4	10	0	1	-2	16	-2

#33 Baker Lake (64°N, 96°W)

850	3	-6	6	-4	3	-6	5	-3
700	6	-6	11	-6	6	-8	8	-5
500	11	-6	19	-7	10	-10	15	-7
300	15	-6	27	-10	15	-10	23	-7
200	16	-9	20	-9	14	-8	24	-6
150	19	-12	17	-6	10	-8	23	-6
100	23	-17	14	-5	5	-7	21	-6

#34 Coral Harbor (64°N, 83°W)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	2	-2	4	-4	1	-5	2	-3
700	5	-2	9	-5	3	-8	6	-4
500	7	0	16	-5	6	-8	13	-4
300	12	4	20	-3	8	-8	19	2
200	14	0	17	-3	8	-6	22	-3
150	15	-2	17	-2	6	-4	20	-3
100	18	-4	12	-3	2	-4	19	-3

#35 Frobisher Bay (64°N, 69°W)

850	2	0	3	-1	-1	1	1	1
700	4	4	7	0	1	-1	4	0
500	4	9	12	2	4	0	9	1
300	7	13	16	5	6	3	17	1
200	10	10	15	5	6	3	18	2
150	13	9	12	4	5	2	17	2
100	16	7	9	3	2	1	18	1

#39 Churchill (59°N, 94°W)

850	6	-8	5	-6	4	-7	6	-6
700	11	-7	9	-6	7	-8	11	-7
500	16	-8	14	-9	13	-10	19	-9
300	24	-9	31	-8	22	-11	31	-8
200	25	-11	26	-7	23	-10	32	-8
150	26	-13	22	-6	18	-8	29	-7
100	30	-14	16	-5	10	-7	24	-6

*Speed is in knots; winds from the west and south are positive

Table 2. Climatic Mean Monthly Observed East-West and North-South Winds* (Cont.)

#40 Goose Bay (53°N, 60°W)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	4	-7	2	-4	11	1	11	-2
700	8	-2	5	-2	17	1	17	-2
500	14	2	11	1	24	4	28	1
300	24	8	21	6	37	8	44	5
200	31	9	19	5	37	8	44	6
150	32	9	16	6	27	6	36	4
100	34	9	12	5	13	3	26	2

#44 Maniwaki (46°N, 76°W)

850	14	-4	7	-2	12	-1	13	1
700	23	-4	15	-5	19	-2	21	0
500	37	-6	28	-8	27	-3	31	1
300	55	-1	41	-12	35	-1	45	0
200	54	0	39	-10	44	-4	47	-2
150	50	0	33	-6	34	-2	41	0
100	40	0	23	-4	16	-2	28	0

#45 Sable Island (44°N, 60°W)

850	20	-2	10	-3	15	5	16	0
700	31	0	18	0	21	4	24	1
500	47	3	28	2	30	6	36	2
300	72	4	41	4	41	8	47	3
200	66	0	41	2	44	6	53	0
150	55	2	32	0	34	4	44	1
100	44	3	22	2	14	2	28	0

#48 Medford (42°N, 123°W)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	6	8	2	1	-1	0	0	4
700	22	2	10	-2	8	8	10	1
500	35	-3	21	-6	17	10	22	-3
300	47	-7	30	-12	28	15	30	-7
200	47	-11	33	-10	37	21	34	-7
150	40	-11	28	-5	32	19	34	-5
100	28	-8	20	-2	12	8	23	-3

#49 Spokane (48°N, 118°W)

850	12	10	7	6	5	3	7	5
700	22	3	11	4	11	5	16	2
500	37	-3	18	2	21	9	27	-1
300	56	-10	27	-1	37	15	38	-7
200	51	-14	27	-3	45	16	41	-8
150	40	-12	21	-2	35	12	35	-5
100	31	-9	15	1	15	5	25	-3

#50 Boise (44°N, 116°W)

850	4	4	4	-4	2	-3	2	0
700	20	-2	11	-4	9	2	11	-2
500	35	-6	18	0	21	11	21	-3
300	50	-13	25	-1	35	16	30	-6
200	49	-15	28	-3	44	21	33	-9
150	39	-11	24	0	39	16	32	-6
100	30	-9	18	2	14	6	23	-4

*Speed is in knots; winds from the west and south are positive

Table 2. Climatic Mean Monthly Observed East-West and North-South Winds* (Cont.)

#51 Great Falls (47°N, 111°W)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	15	7	10	3	6	2	13	6
700	27	-5	12	-3	13	2	18	-4
500	36	-11	18	-1	27	6	28	-6
300	52	-17	26	1	42	8	40	-9
200	47	-15	25	1	53	10	39	-9
150	41	-11	22	1	42	7	36	-6
100	31	-9	16	2	17	3	24	-3

#52 Bismark (47°N, 101°W)

850	12	-8	4	-3	7	-1	10	-7
700	22	-11	11	-5	16	-5	18	-9
500	36	-15	22	-3	28	-7	28	-8
300	52	-18	31	0	43	-8	38	-7
200	49	-15	34	2	54	-7	44	-7
150	46	-12	28	0	44	-7	38	-5
100	37	-11	22	-1	18	-5	26	-6

#53 North Platte (41°N, 101°W)

850	11	-7	5	-2	5	6	7	-4
700	21	-10	14	-3	8	0	14	-6
500	34	-11	24	2	16	-6	23	-4
300	47	-13	38	7	34	-7	33	-4
200	56	-10	44	10	42	-8	41	-4
150	51	-7	39	5	36	-10	39	-4
100	35	-7	27	2	12	-4	24	-3

#54 Rapid City (44°N, 103°W)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	11	-7	7	-5	4	2	9	-8
700	22	-12	12	-5	14	-2	14	-8
500	35	-13	21	0	22	-3	26	-7
300	50	-18	30	4	40	-3	36	-5
200	50	-14	35	4	52	-4	40	-6
150	46	-9	32	3	43	-4	36	-4
100	35	-8	23	2	16	-3	24	-4

#55 International Falls (49°N, 93°W)

850	12	-5	4	-2	11	-2	11	-2
700	20	-9	11	-4	16	-6	18	-4
500	32	-12	22	-5	26	-10	28	-6
300	47	-15	35	-5	41	-14	41	-8
200	46	-13	34	-3	50	-14	44	-6
150	43	-10	29	-3	38	-12	36	-5
100	37	-11	22	-3	19	-8	25	-5

#56 Saulte Ste Marie (46°N, 84°W)

850	13	-3	7	-1	11	-2	13	1
700	22	-4	14	-3	18	-4	20	1
500	35	-5	26	-6	28	-7	30	0
300	54	-4	42	-7	38	-11	43	-2
200	55	-3	45	-5	46	-15	46	-2
150	50	-4	35	-5	34	-12	40	-2
100	44	-4	25	-4	17	-6	27	-2

*Speed is in knots; winds from the west and south are positive

Table 2. Climatic Mean Monthly Observed East-West and North-South Winds* (Cont.)

#57 St. Cloud (46°N, 94°W)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	13	-6	5	-2	10	-2	12	-2
700	22	-10	14	-3	15	-6	19	-5
500	36	-14	23	-4	25	-10	29	-3
300	53	-15	36	-2	40	-13	40	-5
200	52	-11	41	0	50	-13	44	-4
150	47	-10	34	-2	40	-14	40	-4
100	38	-9	23	-1	17	-8	26	-4

#58 Buffalo (43°N, 79°W)

850	20	1	13	-1	12	-1	15	2
700	31	-2	22	-4	17	-1	21	1
500	48	-2	33	-7	25	-1	31	1
300	63	2	48	-9	35	-2	43	3
200	62	-1	49	-9	42	-7	47	2
150	53	-1	39	-6	32	-5	41	2
100	43	-1	27	-3	17	-3	29	1

#59 Caribou (47°N, 68°W)

850	14	-6	8	-6	12	0	14	-3
700	23	-4	14	-6	19	1	22	-2
500	38	0	24	-6	30	3	35	1
300	57	5	36	-6	43	8	48	5
200	56	3	36	-5	46	5	50	2
150	50	4	29	-3	36	5	43	1
100	42	4	21	-1	16	2	29	1

#60 Nantucket (41°N, 70°W)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	19	-5	12	-6	10	1	13	0
700	32	-2	22	-6	17	1	21	2
500	50	0	34	-8	25	4	32	6
300	73	3	50	-11	37	8	46	9
200	74	-1	51	-12	42	4	51	5
150	62	1	42	-8	33	0	44	4
100	47	1	31	-6	15	-1	31	4

#61 Oakland (38°N, 122°W)

850	7	0	6	-4	5	0	2	-2
700	15	-3	10	-5	4	6	6	-2
500	28	-6	20	-10	9	8	15	-5
300	41	-11	33	-14	19	14	22	-8
200	47	-14	39	-12	24	22	29	-9
150	42	-12	36	-6	24	22	29	-6
100	28	-9	25	-1	6	7	21	-4

#62 San Diego (33°N, 117°W)

850	4	-3	7	-3	4	-2	2	-2
700	12	-5	13	-2	2	7	5	-1
500	22	-8	27	-2	2	7	14	-2
300	36	-11	42	1	9	14	28	-2
200	49	-9	52	3	10	22	37	-1
150	47	-6	50	6	9	20	36	1
100	33	-4	34	6	-3	5	20	-2

*Speed is in knots; winds from the west and south are positive

Table 2. Climatic Mean Monthly Observed East-West and North-South Winds[1] (Cont.)

#63 Ely (39°N, 115°W)

mb	JAN		APR		JULY		OCT	
	E W	N S	E W	N S	E W	N S	E W	N S
850	-	-	-	-	-	-	-	-
700	11	-2	7	-1	6	7	5	0
600	27	-10	19	0	10	10	16	-4
500	37	-16	29	-4	26	16	23	-4
400	44	-16	34	-2	36	24	28	-6
300	42	-12	31	1	31	17	28	-4
200	29	-9	21	3	6	6	16	-4

#64 Grand Junction (39°N, 109°W)

mb	JAN		APR		JULY		OCT	
	E W	N S	E W	N S	E W	N S	E W	N S
850	-4	2	-6	3	-1	-1	-5	3
700	12	1	9	4	4	0	7	1
600	28	-9	21	5	18	10	17	-2
500	43	-15	36	4	22	-5	30	-3
400	47	-16	40	4	31	10	37	-4
300	42	-10	35	5	29	10	33	-2
200	30	-5	25	3	4	-1	21	-2

#65 El Paso (32°N, 106°W)

mb	JAN		APR		JULY		OCT	
	E W	N S	E W	N S	E W	N S	E W	N S
850	-4	-1	-6	-2	-2	3	1	1
700	13	-1	10	3	+2	3	6	3
600	25	-2	24	12	-7	0	13	3
500	43	1	34	17	-4	-1	31	4
400	56	1	50	17	-3	-3	44	4
300	54	1	50	14	-4	-2	42	4
200	38	0	30	8	-6	-2	23	0

#66 Oklahoma City (35°N, 98°W)

mb	JAN		APR		JULY		OCT	
	E W	N S	E W	N S	E W	N S	E W	N S
850	13	1	12	7	8	9	9	5
700	23	-1	20	4	3	1	12	0
600	42	1	33	6	4	-3	21	1
500	61	2	51	14	8	-11	38	3
400	76	1	66	14	10	-16	50	3
300	68	1	58	8	8	-14	45	1
200	51	0	39	4	-3	-6	27	0

#67 Columbia (39°N, 92°W)

mb	JAN		APR		JULY		OCT	
	E W	N S	E W	N S	E W	N S	E W	N S
850	16	-2	16	3	10	0	14	-2
700	24	-5	23	0	10	-4	16	-4
600	40	-4	27	2	13	-8	28	-3
500	53	-4	50	7	20	18	39	-6
400	62	-4	60	5	24	-22	47	-5
300	56	-3	54	2	20	-20	44	-4
200	42	-4	33	1	6	-10	26	-2

#68 Dayton (40°N, 84°W)

mb	JAN		APR		JULY		OCT	
	E W	N S	E W	N S	E W	N S	E W	N S
850	20	0	15	1	10	-1	12	1
700	31	0	27	-1	14	-2	18	1
600	46	2	36	-2	18	-3	27	2
500	71	7	54	-3	28	-7	41	2
400	75	4	61	-4	36	-12	49	2
300	66	4	50	-5	29	-11	43	0
200	50	2	35	-2	12	-6	28	0

[1] Speed is in knots; winds from the west and south are positive

Table 2. Climatic Mean Monthly Observed East-West and North-South Winds* (Cont.)

#70 Brownsville (26°N, 97°W)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	3	8	0	16	-4	16	-2	3
700	13	6	9	8	-6	6	2	-1
500	30	8	23	4	-6	0	9	1
300	56	16	50	7	-8	-6	27	4
200	68	17	67	9	-11	-7	39	3
150	62	17	63	12	-13	-9	34	4
100	42	11	36	9	-19	-7	16	0

#71 Nashville (36°N, 87°W)

850	16	0	14	3	8	0	8	1
700	29	0	22	1	9	-1	13	0
500	48	3	38	1	11	-3	23	1
300	70	9	56	0	17	-8	38	0
200	80	9	69	-2	20	-11	50	0
150	70	5	60	-2	14	-13	46	0
100	52	3	33	3	2	-6	27	0

#72 Shreveport (32°N, 94°W)

850	13	2	10	9	3	4	4	1
700	23	1	19	3	1	1	9	-1
500	41	4	34	5	0	-3	19	0
300	62	10	57	8	-2	-10	35	1
200	77	10	72	6	-2	-13	47	0
150	67	7	66	5	-4	-13	44	0
100	50	4	43	4	-9	-6	24	0

#74 Washington (Dulles) (39°N, 77°W)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	18	-6	14	-4	7	-2	9	-2
700	31	-1	22	-5	14	0	16	0
500	51	2	36	-5	20	2	26	2
300	77	6	56	-9	30	1	39	4
200	83	2	62	-14	34	-4	49	3
150	70	2	51	-10	26	-4	43	3
100	52	2	34	-5	11	-3	28	2

#75 Cape Hatteras (35°N, 76°W)

850	19	1	13	-3	8	2	4	0
700	33	2	23	-3	12	3	11	2
500	54	4	37	-6	14	3	22	3
300	77	9	55	-10	15	2	36	6
200	88	3	63	-18	17	-4	48	3
150	72	2	57	-12	12	-6	43	0
100	58	2	40	-7	1	-3	26	0

#76 Charleston (33°N, 80°W)

850	17	3	12	-1	7	3	2	0
700	29	3	20	-2	8	2	10	1
500	48	4	35	-5	8	2	19	2
300	74	8	51	-8	7	0	33	1
200	87	8	64	-13	6	-5	45	1
150	79	6	57	-11	2	-7	41	0
100	56	5	40	-6	-4	-4	24	-1

*Speed is in knots; winds from the west and south are positive

Table 2. Climatic Mean Monthly Observed East-West and North-South Winds* (Cont.)

#77 Miami (26°N, 80°W)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	3	3	-1	2	-5	5	-4	2
700	12	2	6	-3	-4	4	2	2
500	28	4	19	-6	-2	1	8	0
300	49	5	37	-9	-6	-4	21	-1
200	63	7	55	-12	-9	-8	32	-2
150	59	8	53	-10	-10	-10	29	-4
100	42	5	35	-8	-14	-5	11	-3

#81 Merida (21°N, 90°W)

850	-4	4	-9	6	-13	3	-5	-2
700	2	4	-3	3	-11	2	-4	0
500	15	8	9	-1	-8	0	0	0
300	30	10	28	-1	-1	0	10	2
200	36	9	36	-1	3	-1	14	1
150	36	13	35	2	0	-2	13	0
100	21	8	18	1	-14	-4	3	-1

#84 Juliana Airfield (18°N, 63°W)

850	-13	1	-9	2	-18	4	-9	3
700	-8	0	-2	0	-14	4	-6	2
500	-1	-3	8	-2	-8	2	-3	1
300	18	-10	31	-7	5	1	3	-2
200	31	-10	43	-6	11	0	7	-7
150	25	-12	36	-8	9	0	10	-9
100	9	-8	18	-8	-9	0	2	-4

#85 Grand Cayman (19°N, 81°W)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	-9	0	-10	2	-16	3	-8	2
700	-3	2	-4	-1	-12	3	-4	2
500	7	5	6	-4	-7	1	-3	0
300	24	4	24	-7	-1	-5	4	-3
200	36	13	36	-4	6	-7	10	-4
150	34	7	32	-4	4	-8	9	-4
100	16	4	14	-7	-14	-4	0	-5

#86 Swan Island (17°N, 84°W)

850	-10	-1	-12	4	-21	4	-7	0
700	-6	1	-6	1	-18	5	-6	2
500	1	3	2	-4	-10	3	-5	0
300	23	7	19	-4	0	-4	0	-3
200	34	14	30	0	1	-5	4	-4
150	30	12	29	1	8	-7	4	-4
100	16	6	10	-4	-14	-4	-4	-5

#87 Kingston (18°N, 77°W)

850	-13	2	-11	1	-22	4	-12	4
700	-7	2	-6	0	-15	5	-7	4
500	3	1	5	-5	-8	2	-4	0
300	25	3	24	-8	3	-3	0	-6
200	39	10	37	-3	13	-7	7	-9
150	36	6	36	-2	11	-6	7	-8
100	15	1	15	-7	-9	-2	-1	-6

*Speed is in knots; winds from the west and south are positive

Table 2. Climatic Mean Monthly Observed East-West and North-South Winds* (Cont.)

#88 San Juan (18°N, 66°W)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	-13	-1	-9	-1	-18	2	-10	2
700	-8	-1	-3	-1	-14	3	-6	2
500	1	-1	8	-2	-8	1	-3	0
300	24	-7	12	-5	4	1	2	-4
200	39	-2	47	0	11	1	8	-9
150	15	-4	44	-1	9	0	11	-16
100	15	-5	22	-7	-9	-1	2	-4

#89 Ratzet (16°N, 62°W)

850	-16	0	-12	2	-18	2	-11	1
700	-10	-1	-4	0	-18	3	-9	1
500	0	-1	7	-2	-9	1	-1	0
300	18	-4	10	-5	1	1	5	1
200	28	-1	44	-1	10	3	7	-2
150	25	-4	38	-2	9	2	10	-3
100	7	-4	17	-5	-12	1	4	-2

#90 Dr. A. Pleaman AP (12°S, 60°W)

850	-18	2	-13	2	-20	5	-12	4
700	-12	3	-6	2	-19	6	-10	4
500	-6	-2	0	-2	-14	2	-6	1
300	13	-1	15	0	-2	3	1	-1
200	28	0	28	7	7	-1	11	-5
150	23	3	24	4	10	-4	14	-5
100	7	-4	11	-3	-6	0	6	-3

#115 Nord (82°N, 17°W)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	5	-3	3	-1	3	-5	4	-4
700	8	1	4	2	3	-2	6	-3
500	14	3	10	5	3	2	9	2
300	15	3	15	7	5	3	15	2
200	15	3	14	3	2	5	16	0
150	16	-1	13	1	1	4	18	0
100	14	-3	13	-2	-1	5	18	0

#123 Keflavik (64°N, 21°W)

850	-2	8	2	5	1	2	0	4
700	4	9	7	5	5	0	7	5
500	9	10	14	6	10	-2	16	8
300	18	12	21	2	17	-3	27	10
200	21	12	17	6	16	-1	28	8
150	24	11	17	2	12	0	24	7
100	28	9	15	0	5	1	20	5

#124 Jan Mayen (71°N, 8°W)

850	2	2	2	-1	0	0	3	-2
700	6	3	7	0	2	1	10	0
500	14	3	14	-1	4	2	19	-1
300	25	1	24	-2	7	2	28	2
200	28	0	22	-3	6	4	29	2
150	31	-1	21	-3	5	5	28	1
100	36	-2	20	-6	2	4	27	0

*Speed is in knots; winds from the west and south are positive

Table 2 Climatic Mean Monthly Observed East-West and North-South Winds* (Cont.)

#125 Bjornoya (75°N, 19°E)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	6	-3	2	-1	4	2	3	-1
700	12	-5	6	-3	7	4	11	-2
500	20	-9	13	-6	10	6	17	-4
300	27	-12	18	-9	14	10	26	-7
200	28	-12	19	-9	11	7	26	-7
150	29	-13	19	-9	7	6	26	-8
100	31	-14	18	-9	4	5	26	-10

#126 Valentia Observatory (52°N, 10°W)

850	11	12	10	-2	10	0	10	7
700	15	7	11	-4	15	-1	13	7
500	20	6	15	-7	20	-2	20	7
300	29	2	21	-12	28	-5	28	7
200	28	2	20	-11	27	-6	28	3
150	24	1	14	-8	20	-3	23	2
100	24	0	9	-7	13	0	15	1

#127 Long Kesh (54°N, 8°W)

850	9	6	7	-3	12	0	13	5
700	12	5	9	-4	14	0	17	6
500	17	2	14	-7	20	-1	23	6
300	26	0	20	-11	28	-3	32	5
200	29	-2	18	-10	26	-2	33	3
150	27	-1	14	-8	20	0	26	1
100	27	-3	10	-6	10	1	19	0

#128 Lerwick (60°N, 1°W)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	6	7	3	-2	9	3	12	5
700	10	4	9	-4	12	3	18	5
500	16	2	13	-7	16	4	26	4
300	25	-1	19	-12	23	4	38	4
200	28	-3	17	-10	20	3	36	1
150	26	-4	14	-8	14	3	30	0
100	31	-7	12	-7	7	3	23	-2

#129 Crawley (51°N, 0°W)

850	8	2	6	-3	8	0	8	3
700	12	0	10	-3	12	0	12	3
500	16	-3	15	-6	18	-1	17	3
300	21	-8	21	-9	26	-1	23	2
200	26	-10	18	-10	24	-2	24	-1
150	24	-8	14	-7	21	0	21	-4
100	24	-8	11	-5	11	1	16	-4

#130 Jaegersborg (56°N, 13°E)

850	5	2	6	0	9	2	22	-5
700	8	-1	9	0	10	4	18	-2
500	11	-4	14	0	14	4	24	-6
300	17	-9	20	-2	20	5	32	-11
200	20	-11	16	-3	20	4	31	-11
150	21	-11	13	-2	14	4	25	-8
100	25	-11	10	-2	7	4	19	-6

*Speed is in knots; winds from the west and south are positive

Table 2 Climatic Mean Monthly Observed East-West and North-South Winds* (Cont.)

#131 Bodo (67°N, 14°E)

mb	JAN		APR		JULY		OCT	
	E W	N S	E W	N S	E W	N S	E W	N S
850	8	3	9	3	7	7	12	3
700	14	-2	9	0	9	8	18	-1
500	19	-6	14	-3	12	10	27	-6
400	27	-11	18	-6	16	14	36	-8
300	28	-12	18	-6	14	10	34	-6
250	31	-12	18	-6	10	8	31	-6
200	37	-14	18	-8	6	6	30	-6

#132 Orlandet (64°N, 10°E)

850	9	1	6	2	8	4	13	1
700	14	1	9	0	10	7	19	0
500	17	-2	12	-2	12	10	27	-1
400	22	-5	14	-5	17	13	32	-4
300	24	-7	16	-6	14	9	30	-5
250	26	-8	15	-6	11	7	28	-6
200	30	-10	14	-6	7	6	26	-6

#133 Oslo Gardermoen (60°N, 11°E)

850	4	1	1	0	2	1	10	0
700	8	0	3	-1	6	4	16	-2
500	15	-4	11	-3	12	9	24	-6
400	24	-11	17	-6	19	8	36	-9
300	25	-12	15	-6	18	7	35	-10
250	25	-12	14	-5	13	6	30	-8
200	26	-13	12	-5	8	6	26	-8

#136 Stockholm (59°N, 18°E)

mb	JAN		APR		JULY		OCT	
	E W	N S	E W	N S	E W	N S	E W	N S
850	5	0	5	0	6	2	14	-2
700	7	-1	7	1	7	2	19	-3
500	13	-3	13	2	12	5	27	-6
400	19	-11	20	2	20	6	39	-10
300	21	-12	17	-1	17	5	36	-10
250	23	-12	14	-2	13	4	30	-8
200	27	-14	11	-2	6	4	23	-6

#137 Goteborg (58°N, 12°E)

850	4	1	5	2	7	4	13	2
700	6	-1	8	0	10	5	17	0
500	11	-4	11	-1	13	6	24	-4
400	17	-9	20	-3	18	8	32	-8
300	20	-10	17	-3	24	15	31	-9
250	21	-9	14	-2	12	5	25	-7
200	25	-11	10	-5	6	4	20	-6

#138 Sodankyla (67°N, 27°E)

850	10	1	4	2	4	4	8	-2
700	12	-4	8	0	7	4	12	-4
500	18	-9	13	-2	10	7	20	-8
400	23	-13	22	-5	14	7	30	-11
300	27	-17	20	-6	13	6	30	-12
250	28	-17	18	-7	9	5	28	-12
200	33	-19	18	-9	7	4	26	-11

*Speed is in knots; winds from the west and south are positive

Table 2. Climatic Mean Monthly Observed East-West and North-South Winds[a] (Cont.)

*140 Joktotnen (61°N, 25°E)

mb	JAN		APR		JULY		OCT	
	E W	N S	E W	N S	E W	N S	E W	N S
850	6	1	4	3	4	3	12	-3
700	10	-2	8	3	5	2	15	-5
500	14	-6	14	4	9	3	22	-9
400	21	-11	20	6	15	6	28	-13
300	23	-14	18	2	14	4	29	-15
250	25	-14	16	1	10	3	27	-14
200	29	-17	14	-1	4	2	24	-11

*141 Brest Guipavas (48°N, 4°W)

850	11	4	6	-2	6	-2	7	5
700	15	1	10	-2	11	-1	10	4
500	20	-1	14	-7	18	-1	15	3
400	30	-6	20	-12	26	-2	17	4
300	30	-8	20	-12	29	-2	21	-1
250	26	-6	16	-7	24	0	18	-2
200	23	-6	12	-5	18	1	14	-2

*142 Bordeaux Merignac (44°N, 1°W)

850	11	-1	8	-1	6	1	6	5
700	13	-4	10	-3	8	1	7	2
500	18	-7	14	-6	10	0	10	1
400	25	-13	20	-10	27	0	13	-1
300	27	-14	22	-10	33	0	14	-4
250	26	-11	1[illegible]	-6	30	1	14	-3
200	22	-8	14	-4	17	2	12	-2

*144 Nancy (49°N, 6°E)

mb	JAN		APR		JULY		OCT	
	E W	N S	E W	N S	E W	N S	E W	N S
850	8	2	7	2	6	2	7	4
700	10	-2	10	1	12	2	10	2
500	14	-7	13	-2	17	1	14	0
300	19	-12	19	-5	24	0	17	-2
200	21	-12	17	-4	26	0	18	-4
150	21	-11	16	-2	22	1	18	-4
100	22	-9	12	0	12	3	14	-3

*145 Trappes (49°N, 2°E)

850	8	3	7	-1	6	0	7	3
700	11	0	10	-1	12	1	10	3
500	17	-4	15	-4	18	0	15	2
300	23	-9	22	-9	25	-1	17	0
200	25	-10	20	-7	27	-2	19	-3
150	24	-8	19	-4	23	0	18	-2
100	23	-7	15	-3	14	1	14	-2

*146 Nimes (44°N, 4°E)

850	1	-6	1	-6	2	-7	-2	-2
700	3	-7	7	-6	10	-4	4	0
500	13	-11	14	-6	18	-4	8	-2
300	20	-19	20	-8	26	-4	12	-5
200	22	-18	22	-6	33	-4	14	-6
150	22	-14	20	-4	28	-1	14	-5
100	20	-11	14	-2	12	0	11	-3

[a] Speed is in knots; winds from the west and south are positive.

Table 2 — Climatic Mean Monthly Observed East-West and North-South Winds[a] (Cont.)

#143 DeBilt (52°N, 5°E)

mb	JAN		APR		JULY		OCT	
	E W	N S	E W	N S	E W	N S	E W	N S
850	8	2	7	0	7	2	9	2
700	10	-1	10	1	12	2	11	2
500	14	-5	17	-3	18	1	15	0
300	20	-11	21	-6	24	1	21	-2
200	22	-13	20	-5	24	1	25	-4
150	23	-11	18	-4	19	1	23	-3
100	23	-10	13	-4	10	2	16	-2

#142 Munchen Riem (48°N, 12°E)

mb	JAN		APR		JULY		OCT	
	E W	N S	E W	N S	E W	N S	E W	N/S
850	9	1	8	-1	8	-1	7	1
700	12	-3	12	0	12	-1	10	-2
500	14	-6	15	0	14	-1	11	-3
300	18	-10	21	0	20	-1	14	-7
200	17	-13	21	-3	24	-2	15	-9
150	13	-13	17	-2	21	0	16	-7
100	10	-11	14	-1	11	2	14	-5

#149 Payerne (47°N, 7°E)

mb								
850	5	4	4	2	3	1	1	2
700	8	0	8	2	6	4	6	3
500	13	-9	13	-2	15	-2	9	-1
400	19	-15	19	-5	22	-1	10	-3
200	21	-14	20	-5	26	-2	12	-5
150	21	-13	18	-3	25	0	13	-5
100	22	-12	14	-2	15	1	12	-4

#143 Hannover (52°N, 10°E)

mb								
850	8	2	9	0	11	1	10	2
700	9	-2	11	-1	13	1	13	0
500	12	-6	16	0	17	2	17	-2
300	18	-12	21	-2	23	2	24	-5
200	20	-12	18	-4	22	2	24	-7
150	20	-11	14	-3	16	3	20	-5
100	23	-11	12	-2	9	3	16	-4

#151 Stuttgart Canstatt (49°N, 9°E)

mb								
850	8	1	7	0	6	1	6	2
700	10	-2	11	1	12	2	9	1
500	13	-7	14	0	15	0	13	-1
300	17	-12	19	-2	21	0	15	-5
200	20	-14	18	-3	23	-1	17	-6
150	20	-12	15	-2	20	1	16	-5
100	21	-10	13	-1	10	2	13	-4

#154 Berlin Tempelhof (52°N, 13°E)

mb								
850	6	0	7	0	9	0	10	0
700	8	-2	11	0	11	1	14	-3
500	11	-5	15	1	14	2	18	-5
300	14	-9	20	1	19	3	22	-8
200	17	-12	19	-1	19	2	22	-9
150	19	-11	13	-1	14	3	20	-7
100	21	-11	11	-1	7	3	15	-5

[a] Speed is in knots; winds from the west and south are positive

Table 2. Climatic Mean Monthly Observed East-West and North-South Winds* (Cont.)

#160 Iceland (65°N, 19°E)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	1	0	7	0	10	2	10	2
700	7	-1	10	0	12	2	14	0
500	11	1	13	-1	14	2	22	-2
300	17	-6	20	-3	21	0	31	-6
200	22	-10	17	-4	21	0	30	-7
150	19	-9	11	-3	16	0	24	-5
100	17	-9	11	-3	9	2	14	-5

#161 Reykjavik (64°N, 22°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	0	2	8	2	3	-1	9	2
700	0	-1	9	2	6	-1	8	-2
500	11	-4	13	4	9	-2	11	-3
300	18	-7	16	4	11	-2	15	-5
200	21	-9	18	2	16	-1	15	-7
150	23	-8	18	2	16	4	14	-6
100	28	-8	17	2	9	4	14	-4

#162 Emden (53°N, 7°E)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	7	2	7	0	10	2	11	2
700	9	-2	10	-1	12	2	14	2
500	13	-5	13	-2	16	3	20	0
300	20	-9	21	-4	24	3	29	-3
200	20	-11	17	-3	22	3	30	-5
150	21	-10	14	-4	16	3	22	-4
100	23	-9	10	-2	9	3	16	-4

#163 Hudgensal-Loering (67°N, 19°E)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	5	0	4	0	3	-3	6	0
700	7	-1	7	0	6	-3	8	-2
500	10	-4	12	2	9	-3	10	-5
300	15	-6	14	2	12	-3	13	-8
200	20	-10	20	0	19	-2	15	-10
150	22	-11	20	0	20	2	16	-9
100	24	-10	18	0	15	6	17	-7

#164 Wien Hohe Warte (48°N, 16°E)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	7	-1	6	-3	6	-4	7	-2
700	8	-6	8	-2	9	-7	11	-4
500	10	-4	12	2	11	-4	12	-4
300	16	-11	19	2	16	-4	15	-8
200	17	-12	18	0	23	-2	17	-10
150	20	-12	16	0	22	2	17	-7
100	22	-11	14	0	11	4	14	-5

#167 North Front (36°N, 5°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	9	0	4	-1	0	3	1	3
700	14	-3	11	-1	14	8	10	3
500	20	-7	16	-3	22	10	14	0
300	30	-13	30	-4	31	7	22	-1
200	39	-12	37	-4	39	7	27	-3
150	38	-9	36	-2	34	7	24	-3
100	31	-6	26	-1	14	4	16	-1

*Speed is in knots, winds from the west and south are positive

Table 2 Climatic Mean Monthly Observed East-West and North-South Winds* (Cont.)

*174 Pratica Campoformido (46°N, 13°E)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	0	0	4	-6	0	0	0	1
700	7	-2	7	0	7	-4	5	-4
500	14	-7	16	1	18	-5	11	-9
300	22	-17	28	-2	29	-6	15	-16
200	25	-16	31	-4	30	-7	16	-18
150	20	-16	28	-2	28	-2	18	-14
100	28	-14	24	0	22	3	17	-9

*175 Milano/Linate (45°N, 9°E)

850	-1	-2	0	-1	1	0	0	0
700	5	-4	5	-1	6	-3	4	-2
500	14	-12	16	-3	20	-6	10	-7
300	22	-23	27	-8	32	-10	16	-14
200	25	-24	30	-7	43	-10	18	-14
150	22	-20	25	-5	38	-4	18	-12
100	27	-16	18	-2	19	0	15	-8

*176 Roma/Fiumicino (42°N, 12°E)

850	4	1	4	4	8	0	2	3
700	9	-5	12	1	13	-3	6	-2
500	17	-11	24	-1	27	-10	11	-5
300	26	-20	38	-3	41	-11	20	-7
200	34	-20	45	-2	55	-7	23	-10
150	37	-18	40	-1	50	1	25	-7
100	35	-15	32	1	26	4	22	-2

*177 Brindisi (41°N, 18°E)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	6	1	7	4	7	-10	3	-4
700	12	2	14	1	14	-8	6	-2
500	24	0	27	6	29	-8	16	-3
300	39	-2	46	6	44	-7	25	-5
200	49	-3	53	6	63	8	30	-5
150	46	-3	46	7	56	6	29	-1
100	40	-2	34	6	27	10	24	2

*178 Cagliari/Elmas (39°N, 9°E)

850	14	-7	11	-4	10	-5	4	-3
700	21	-10	18	-2	20	-6	10	-4
500	27	-12	27	-2	32	-9	15	-5
300	38	-20	39	-3	45	-9	20	-7
200	42	-14	46	-2	54	-4	25	-7
150	40	-9	42	0	47	0	25	-6
100	34	-7	32	1	24	2	20	-2

*180 Qrendi (36°N, 14°E)

850	11	-3	9	-1	6	-6	5	-1
700	16	-4	18	0	13	-9	11	-2
500	24	-7	31	0	21	-12	16	-4
300	38	-10	50	2	34	-6	23	-4
200	50	-9	62	0	46	5	29	-4
150	48	-7	56	1	43	9	28	2
100	38	-6	38	1	20	8	22	0

*Speed is in knots; winds from the west and south are positive

Table 2. Climatic Mean Monthly Observed East-West and North-South Winds* (Cont.)

#181 Zagreb (46°N, 16°E)

mb	JAN		APR		JULY		OCT	
	E W	N S	E W	N S	E W	N S	E W	N S
850	2	-2	3	-1	0	-4	2	1
700	5	-2	6	0	5	-5	4	-1
500	10	-4	11	2	10	-5	8	-3
300	16	-9	17	0	16	-6	11	-7
200	18	-9	21	-1	23	-4	14	-8
150	21	-11	20	0	22	0	15	-6
100	22	-10	16	0	13	3	14	-4

#182 Beograd (45°N, 21°E)

850	6	0	4	2	3	-3	3	1
700	7	-1	8	2	6	-4	5	-1
500	10	-4	12	3	10	-4	8	-3
300	19	-4	20	2	15	-4	11	-6
200	22	-7	22	0	24	-2	14	-8
150	24	-7	21	0	25	3	15	-7
100	24	-7	18	1	16	2	16	-5

#186 Bucuresti Baneasa (44°N, 26°E)

850	2	0	1	0	-1	-3	2	-2
700	5	0	5	1	3	-4	5	-3
500	11	-1	10	2	8	-4	8	-6
300	15	-2	16	2	15	-4	12	-6
200	19	-4	19	3	25	3	14	-9
150	22	-5	19	0	30	6	16	-8
100	24	-7	19	1	24	8	18	-6

#190 Istanbul/Goztepe (41°N, 29°E)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	-3	2	6	3	-7	-9	-2	-3
700	6	2	10	5	3	-3	2	-2
500	12	-2	14	6	13	2	13	-2
300	22	-4	23	8	38	18	23	-3
200	33	0	30	6	49	29	29	-2
150	37	-3	29	8	44	26	31	5
100	38	1	27	6	28	19	28	4

#191 Ankara (40°N, 33°E)

850	0	3	3	3	-8	-6	-2	1
700	10	3	10	3	6	-4	5	1
500	16	3	15	4	16	2	10	1
300	26	1	21	0	43	20	21	-1
200	42	5	30	0	59	28	29	6
150	40	1	30	-3	51	24	32	4
100	37	-1	27	1	31	21	26	5

#193 Murmansk (69°N, 33°E)

850	10	-2	5	0	6	1	8	-2
700	10	-4	8	-1	8	2	11	-3
500	15	-8	14	-2	11	3	18	-5
300	21	-11	21	-3	15	3	29	-8
200	22	-13	20	-4	14	4	29	-9
150	22	-13	19	-5	10	3	26	-9
100	24	-14	17	-6	5	3	25	-8

*Speed is in knots; winds from the west and south are positive

Table 2. Climatic Mean Monthly Observed East-West and North-South Winds* (Cont.)

#195 Leningrad (60°N, 30°E)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	4	0	7	4	4	1	13	-1
700	6	-2	11	5	6	1	17	-4
500	10	-5	18	7	10	2	21	-6
300	16	-8	28	10	16	3	32	-11
200	17	-10	25	6	14	3	31	-13
150	19	-10	19	3	11	3	27	-11
100	22	-11	16	0	5	3	22	-8

#200 Moscow (56°N, 38°E)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	7	0	6	4	4	-2	12	-3
700	10	-2	11	5	6	0	16	-4
500	14	-4	16	6	10	0	23	-7
300	18	-8	24	7	15	1	31	-10
200	20	-8	22	4	17	3	30	-10
150	21	-9	21	4	15	4	26	-7
100	25	-10	18	2	8	4	22	-7

#198 Vologda (59°N, 40°E)

850	7	-1	7	3	2	-1	10	-3
700	9	-4	11	2	6	-1	14	-6
500	13	-8	17	3	17	-5	18	-8
300	18	-10	23	5	14	2	23	-9
200	18	-12	23	1	14	2	24	-9
150	21	-13	21	1	13	2	23	-8
100	24	-13	22	0	7	2	20	-10

#203 Kyev (50°N, 30°E)

850	4	0	3	4	2	-1	9	-2
700	8	0	8	5	5	0	13	-4
500	12	-1	13	6	6	0	17	-9
300	17	-3	16	7	9	-1	20	-13
200	18	-3	19	6	14	3	20	-12
150	20	-4	17	5	16	5	21	-8
100	21	-6	16	3	11	5	19	-6

#199 Kazan (56°N, 49°E)

850	9	-2	8	3	4	-2	12	1
700	11	-3	12	3	8	-2	15	-1
500	15	-5	18	2	11	-1	19	-2
300	19	-8	25	4	15	0	24	-4
200	20	-10	25	2	18	0	23	-6
150	21	-10	23	1	17	0	22	-6
100	25	-7	22	0	12	0	22	-6

#204 Saratov (52°N, 46°E)

850	5	1	3	3	4	-1	11	1
700	9	-2	7	5	8	1	16	1
500	13	-5	13	4	10	2	22	1
300	16	-7	18	4	16	6	28	-1
200	20	-7	20	6	22	4	30	-3
150	22	-6	22	5	24	4	28	-2
100	22	-2	19	5	17	3	28	-1

*Speed is in knots; winds from the west and south are positive

Table 2. Climatic Mean Monthly Observed East-West and North-South Winds* (Cont.)

#212 Tobruk (32°N, 24°E)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	14	-2	9	-2	5	-14	6	-2
700	20	-2	21	-2	8	-12	10	-4
500	33	-3	38	-2	14	-6	18	-3
300	59	-5	68	-3	34	11	31	-3
200	78	-2	89	-4	32	21	42	5
150	74	0	80	-4	27	24	40	4
100	55	0	49	-2	10	19	28	5

#216 Port Sudan (20°N, 37°E)

850	0	2	-5	0	8	-2	-9	6
700	14	3	7	2	6	-3	-6	7
500	30	3	20	-1	-6	7	0	4
300	60	1	42	-10	-20	0	14	6
200	67	5	51	-12	-26	7	20	5
150	60	6	47	-7	-40	9	14	7
100	32	2	24	1	-46	9	2	5

#217 Khartoum (16°N, 33°E)

850	-1	-10	-2	-8	6	4	-6	-6
700	9	0	4	-4	-4	-2	-5	-2
500	14	1	7	-3	-7	2	-3	0
300	36	-1	24	-7	-13	0	2	2
200	44	10	30	-10	-24	5	7	1
150	40	4	30	-4	-32	9	5	3
100	22	2	10	-1	-32	6	-3	5

#218 Malakal (10°N, 32°E)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	-5	-6	0	2	1	5	-4	2
700	-4	-1	-4	-5	-4	-4	-10	-3
500	-4	-2	-5	-3	-8	-2	-10	-1
300	6	2	1	-3	-15	-2	-7	0
200	9	8	4	-2	-30	-4	-6	-1
150	9	5	3	-2	-33	1	-5	0
100	2	-1	0	-3	-27	0	-9	2

#220 Dakar-Yoff (15°N, 18°W)

850	-6	-3	-3	-4	-7	1	-10	-2
700	-1	1	-1	4	-19	-2	-14	2
500	12	6	16	4	-20	-1	-5	3
300	36	12	32	7	-12	1	12	6
200	48	4	37	12	-18	4	18	7
150	41	6	34	13	-21	6	22	9
100	19	5	18	8	-24	2	9	6

#222 Abidjan (5°N, 4°W)

850	-7	-5	-6	1	2	0	-8	-1
700	-15	-2	-21	-1	-1	1	-17	1
500	-10	0	-12	0	-3	-1	-10	-1
300	11	5	-5	1	-10	0	-12	1
200	24	5	-4	2	-14	-3	-10	1
150	23	12	-5	4	-10	0	-1	2
100	3	10	-7	5	-10	1	-6	2

*Speed is in knots; winds from the west and south are positive

Table 2. Climatic Mean Monthly Observed East-West and North-South Winds* (Cont.)

#226 Fort-Lamy (12°N, 15°E)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	-4	-6	-6	-5	0	-1	-6	-4
700	-1	2	-8	-1	-10	-4	-11	-2
500	3	3	-7	1	-11	-3	-8	-1
300	24	4	6	-2	-14	-1	-3	0
200	22	14	13	4	-22	-1	-1	1
150	22	13	12	4	-26	3	9	7
100	13	7	3	4	-30	2	-9	9

#250 Naryan-Mar (68°N, 53°E)

850	7	-5	6	-3	4	-2	7	-1
700	9	-8	10	-3	6	2	10	-3
500	13	-12	18	-6	9	0	16	-6
300	15	-14	26	-8	13	2	19	-8
200	16	-16	24	-10	9	2	21	-10
150	18	-17	20	-11	6	1	21	-10
100	20	-18	18	-12	2	2	19	-11

#252 Turukhansk (66°N, 88°E)

850	5	1	7	0	2	5	4	6
700	9	-1	9	-2	6	5	7	3
500	12	-5	14	-2	8	8	10	3
300	13	-8	16	-5	10	10	11	2
200	12	-7	17	-4	8	11	11	2
150	15	-5	15	-4	3	12	10	2
100	18	-4	14	-4	4	6	11	2

#253 Syktyvkar (62°N, 51°E)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	3	-3	9	1	3	-3	9	0
700	10	-4	15	1	6	-2	11	-1
500	15	-6	21	-1	11	-3	16	-3
300	17	-8	28	-2	14	0	21	-7
200	21	-8	26	-2	16	-1	22	-8
150	21	-10	24	-4	13	0	22	-9
100	24	-10	22	-6	7	0	20	-8

#256 Verkhoiansk (68°N, 133°E)

850	0	1	2	1	0	-3	6	1
700	-1	2	4	2	4	-2	6	0
500	-1	4	9	3	7	-4	11	-2
300	0	7	10	4	12	-6	17	-3
200	2	10	8	3	10	-6	16	-2
150	3	12	6	4	7	-5	14	0
100	9	18	7	7	5	-5	14	1

#257 Tura (64°N, 100°E)

850	8	-4	8	-1	1	0	12	2
700	9	-5	13	-3	2	1	14	0
500	11	-5	16	-7	5	3	17	1
300	11	-6	18	-5	9	7	24	-5
200	14	-3	20	-4	0	8	23	-1
150	13	-8	17	-5	3	2	19	-3
100	15	-5	17	-6	1	1	15	-1

*Speed is in knots; winds from the west and south are positive

Table 2. Climatic Mean Monthly Observed East-West and North-South Winds* (Cont.)

#258 Yakutsk (62°N, 130°E)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	5	-4	4	0	0	0	8	-5
700	4	-4	6	0	0	0	10	-5
500	6	-4	10	1	4	-2	13	-6
300	6	-2	13	2	12	-6	19	-6
200	5	0	12	2	12	-7	18	-5
150	8	3	11	3	8	-6	17	-4
100	13	9	11	5	2	-4	18	-1

#263 Omsk (55°N, 73°E)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	12	2	9	0	3	-5	12	5
700	16	0	15	-4	5	-2	19	2
500	21	-1	24	-7	8	-2	25	2
300	27	-4	35	-8	11	-1	31	1
200	30	-3	36	-8	13	-5	32	-1
150	31	-4	34	-7	12	-3	27	2
100	45	-6	31	-7	7	-3	28	-2

#259 MYS Schmidt (69°N, 179°W)

850	-4	1	-	-4	3	0	4	-4
700	-1	6	0	0	5	1	4	-1
500	4	11	4	1	6	1	7	2
300	10	15	8	2	10	0	13	4
200	12	11	9	6	6	-1	14	5
150	16	10	9	8	3	-1	15	6
100	23	11	11	12	1	0	17	7

#264 Kustanay (53°N, 64°E)

850	8	0	6	1	4	-4	14	2
700	12	0	11	0	7	-3	20	2
500	16	-2	17	1	10	-3	23	0
300	22	-5	26	1	13	-3	29	-1
200	25	-5	29	1	18	-4	32	-2
150	28	-4	24	0	20	-7	29	-2
100	31	-4	28	0	18	3	28	-1

#262 Sverdlovsk (57°N, 61°E)

850	12	-2	10	1	4	-3	14	1
700	14	-1	15	1	6	-2	16	2
500	18	-4	21	0	8	-1	20	2
300	24	-6	29	0	11	0	27	3
200	26	-5	28	-1	13	-1	27	1
150	28	-5	28	-1	11	-2	26	-1
100	32	-3	27	-2	7	-1	24	-1

#265 Kolpashev (58°N, 83°E)

850	11	2	12	-5	3	-1	14	3
700	14	0	16	-8	5	-2	18	2
500	18	-3	22	-15	7	-2	24	2
300	22	-6	32	-18	9	0	30	-3
200	24	-6	31	-15	8	-1	30	-5
150	28	-6	30	-15	6	0	27	-5
100	27	-7	28	-15	4	0	25	-5

*Speed is in knots; winds from the west and south are positive

Table 2. Climatic Mean Monthly Observed East-West and North-South Winds* (Cont.)

#266 Krasnoiarsk (56°N, 93°E)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	16	5	14	0	1	0	13	4
700	18	0	20	-2	5	1	16	5
500	24	-3	26	-6	7	4	18	3
300	27	-8	33	-10	8	10	28	4
200	28	-7	31	-9	8	9	27	2
150	28	-6	27	-9	8	7	25	2
100	32	-5	24	-8	6	5	24	1

#267 Kirensk (58°N, 108°E)

850	13	0	8	-1	-4	-3	13	0
700	15	-6	11	-4	-1	-2	16	-3
500	18	-12	14	-8	1	0	21	-6
300	19	-12	19	-11	5	3	24	-8
200	20	-11	18	-8	8	4	23	-7
150	22	-9	20	-9	6	4	24	-6
100	26	-6	20	-7	4	1	22	-4

#268 Chita (52°N, 113°E)

850	9	-7	7	-6	0	-1	6	-5
700	11	-13	11	-9	1	-1	11	-8
500	16	-16	20	-13	4	-1	18	-11
300	22	-20	29	-15	10	-1	27	-10
200	26	-14	29	-13	15	2	29	-11
150	27	-12	31	-11	15	2	27	-9
100	30	-5	28	-8	9	-1	27	-5

#270 Okhotsk (59°N, 143°E)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	-1	-4	-2	-2	-3	3	2	-3
700	0	-3	2	0	-1	-2	6	-3
500	1	0	6	3	4	-3	11	-2
300	3	3	12	6	10	-4	16	1
200	5	8	12	6	11	-6	18	1
150	10	13	12	8	10	-6	20	2
100	14	18	11	10	3	-5	20	4

#271 Blagoveshchensk (50°N, 128°E)

850	5	-10	7	-4	2	5	6	-5
700	9	-10	10	-3	4	2	11	-5
500	15	-12	18	-5	10	2	18	-6
300	21	-11	28	-6	18	3	25	-7
200	25	-4	31	-5	25	4	28	-4
150	29	-4	31	-3	22	2	29	-3
100	32	1	28	-1	12	-1	29	1

#272 Khabarovsk (49°N, 135°E)

350	11	-4	9	1	3	1	9	0
700	10	-8	14	-1	4	0	13	-1
500	15	-9	22	-2	9	-1	20	-3
300	25	-7	32	-2	22	-2	31	0
200	29	-3	37	0	30	-5	35	4
150	32	0	30	4	37	-6	35	6
100	35	2	31	2	13	-5	30	6

*Speed is in knots; winds from the west and south are positive

Table 2. Climatic Mean Monthly Observed East-West and North-South Winds* (Cont.)

#276 Orenburg (52°N, 55°E)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	6	1	3	4	5	-2	12	3
700	10	-1	6	4	7	-2	16	1
500	13	0	12	5	11	-2	20	3
300	19	-4	20	1	16	-2	30	-1
200	23	-7	22	2	25	-2	30	-3
150	23	-4	22	1	27	-2	29	-4
100	27	-2	21	0	17	0	26	-3

#278 Guryev (47°N, 52°E)

850	4	0	0	3	3	-2	9	1
700	8	1	2	3	7	0	15	1
500	12	0	10	2	16	0	21	0
300	24	-4	19	4	31	1	29	0
200	28	-4	20	5	54	2	32	-2
150	29	-2	22	5	48	2	27	-4
100	30	-3	18	2	29	0	27	-1

#279 Alma-Ata (43°N, 77°E)

850	2	1	3	0	2	0	0	0
700	7	3	7	2	12	1	8	3
500	26	5	22	0	19	3	21	4
300	36	7	36	3	36	3	31	-1
200	34	-2	40	2	50	2	37	-3
150	37	-3	38	-2	50	2	39	-3
100	35	2	31	0	35	3	35	-2

#280 Tashkent (41°N, 69°E)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	2	4	2	0	3	-2	3	2
700	16	6	10	7	6	1	13	7
500	24	9	19	9	16	2	18	5
300	36	2	30	14	40	-7	33	-2
200	42	-1	37	9	51	-7	42	-6
150	36	0	36	7	53	-5	41	-7
100	39	-3	30	4	30	-5	34	-3

#282 Hong Kong/King's Park (22°N, 114°E)

850	2	2	3	6	-2	6	-10	-2
700	20	2	14	4	-2	7	-2	-1
500	43	3	24	5	-5	3	6	0
300	65	8	42	5	-10	-1	12	0
200	68	17	52	1	-16	-6	18	0
150	61	18	45	0	-23	-9	14	-3
100	40	7	22	0	-34	-13	7	-3

#284 Wakkanai (45°N, 142°E)

850	10	-5	12	0	6	2	13	2
700	18	-4	18	-2	10	-2	18	1
500	29	-4	32	-2	18	-4	29	4
300	47	-1	52	0	30	-10	48	12
200	50	3	57	3	42	-12	60	18
150	51	6	50	3	35	-12	57	16
100	46	7	41	4	16	-8	46	13

*Speed is in knots; winds from the west and south are positive

Table 2 Climatic Mean Monthly Observed East-West and North-South Winds* (Cont.)

*286 Sapporo (43°N, 141°E)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	13	-5	11	0	6	4	12	0
700	23	-5	20	-2	11	-1	18	1
500	39	-2	36	0	20	-4	31	6
400	60	1	61	2	34	-8	57	17
300	83	4	85	3	48	-14	68	22
250	81	6	79	3	39	-12	67	19
200	73	6	64	3	28	-9	48	14

*288 Sendai (38°N, 141°E)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	20	-4	14	1	9	4	11	1
700	33	-5	24	0	15	0	19	2
500	50	0	39	2	21	-1	37	9
300	84	8	68	5	34	-5	69	23
200	98	8	81	4	42	-12	81	24
150	95	8	72	2	36	-14	77	21
100	72	6	54	2	14	-10	52	14

*286 Nemuro (44°N, 146°E)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	12	-6	11	-1	6	1	11	1
700	23	-8	20	0	11	-1	19	2
500	40	1	36	2	20	-4	34	7
400	59	3	61	4	34	-8	58	20
300	83	6	86	4	46	-13	74	24
250	80	6	77	4	36	-12	67	20
200	70	8	61	3	26	-9	48	13

*287 Wajima (37°N, 137°E)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	16	-1	12	1	12	7	6	2
700	28	0	20	0	16	4	17	2
500	53	-3	40	-1	21	1	37	6
400	92	2	69	1	32	-2	69	17
300	104	8	82	1	39	-9	84	21
250	95	7	73	1	33	-12	76	17
200	74	6	54	1	21	-10	53	12

*287 Akita (40°N, 140°E)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	20	-4	19	6	10	5	12	2
700	36	0	29	1	16	2	21	2
500	62	-2	42	1	22	-3	38	5
400	80	2	62	3	37	-7	68	20
300	86	7	79	4	48	-13	82	23
250	85	8	71	3	41	-14	74	20
200	71	6	54	2	28	-10	52	13

*290 Tateno (36°N, 140°E)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	14	-1	6	3	2	4	3	0
700	27	-2	18	3	12	0	16	3
500	48	1	31	3	18	-1	39	10
400	100	8	53	3	27	-5	70	22
300	122	9	69	3	33	-11	88	22
250	91	12	58	2	29	-13	76	20
200	70	6	46	2	9	-11	50	13

*Speed is in knots; winds from the west and south are positive.

Table 2. Climatic Mean Monthly Observed East-West and North-South Winds* (Cont.)

#291 Hachijojima (33°N, 140°E)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	19	-1	10	2	11	5	2	0
700	33	-1	21	2	13	2	14	3
500	88	2	40	2	14	0	35	11
300	116	11	65	3	15	-5	56	22
200	136	12	81	2	16	-12	69	16
150	128	12	77	1	14	-15	63	16
100	89	8	53	2	-1	-11	41	10

#292 Yonago (35°N, 133°E)

850	15	-4	7	1	10	8	4	0
700	29	-6	19	0	14	3	15	-1
500	59	-5	40	0	18	2	36	3
300	102	4	69	3	25	0	69	13
200	122	8	86	3	30	-4	83	14
150	106	8	78	1	26	-9	72	11
100	83	4	56	0	6	-9	51	9

#293 Shionomisaki (33°N, 136°E)

850	17	-3	6	1	7	3	0	-1
700	31	-3	20	1	12	1	15	2
500	64	0	32	6	15	1	36	9
300	117	9	68	4	18	-2	66	16
200	140	12	83	1	18	-7	77	17
150	129	12	81	2	15	-12	71	14
100	92	8	58	1	0	-10	48	10

#294 Fukuoka (34°N, 130°E)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	12	-6	6	4	9	8	3	-1
700	29	-7	18	0	12	6	14	-2
500	59	-2	38	1	15	2	36	2
300	110	7	66	4	19	1	66	9
200	132	11	81	4	22	-3	80	10
150	120	10	78	2	18	-8	74	9
100	86	8	55	0	1	-9	48	7

#295 Kagoshima (32°N, 131°E)

850	14	-7	10	9	6	6	1	-1
700	32	-5	20	1	10	5	14	-2
500	62	0	38	2	11	2	32	3
300	110	9	62	5	11	0	60	7
200	130	11	79	2	9	-4	69	7
150	121	12	76	2	7	-9	64	7
100	81	7	51	0	-6	-9	39	7

#296 Naze (29°N, 130°E)

850	10	-8	13	8	2	8	-2	-6
700	29	-2	20	3	3	5	8	-1
500	63	4	34	4	3	3	26	3
300	112	11	56	4	0	0	45	4
200	123	16	71	2	-3	-5	51	4
150	113	13	68	2	-7	-8	48	4
100	81	8	45	1	-16	-9	29	5

*Speed is in knots; winds from the west and south are positive

Table 2 Climatic Mean Monthly Observed East-West and North-South Winds* (Cont.)

#299 Aleppo (36°N, 37°E)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	0	1	6	2	12	-6	4	2
700	10	5	11	3	6	1	7	7
500	20	4	20	4	16	4	19	9
400	29	5	25	4	17	17	24	17
300	36	8	36	4	33	28	36	21
250	37	8	34	6	31	25	38	20
200	37	8	36	6	26	20	26	14

#301 Muharraq (26°N, 51°E)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	9	-1	10	-1	6	-16	3	-6
700	21	1	18	1	3	-6	2	-4
500	43	1	40	4	-7	0	10	1
400	80	2	63	6	-12	-2	31	5
300	98	0	73	7	-17	2	41	9
250	87	0	66	4	-24	1	38	10
200	64	2	40	8	-36	1	20	6

#300 Beyrouth Khaldeh (34°N, 35°E)

850	6	6	6	5	4	-1	5	4
700	13	4	15	4	10	0	9	5
500	27	4	29	5	16	8	20	7
400	52	1	51	2	30	13	40	10
300	71	1	68	3	38	18	50	16
250	69	4	56	0	33	19	46	15
200	52	3	44	3	29	18	31	12

#303 New Delhi Safdarjung (29°N, 77°E)

850	8	-4	10	-5	3	-1	6	-5
700	14	-2	16	-4	2	-4	9	-8
500	17	-1	25	-6	1	-1	17	-5
400	27	1	34	-1	0	2	46	0
300	42	6	50	-1	-3	4	57	8
250	35	5	34	0	-6	3	50	8
200	26	4	30	1	-18	-3	27	2

#402 Matrah Ap (23°N, 58°E)

850	8	6	9	1	13	-7	5	2
700	16	4	17	1	12	2	10	10
500	34	3	29	1	16	5	22	11
400	61	5	52	2	23	11	42	17
300	84	6	68	1	24	17	56	22
250	83	5	65	4	20	21	57	20
200	64	4	49	2	7	18	41	17

#421 Chiang Mai (19°N, 99°E)

850	2	4	6	1	8	1	-5	3
700	12	0	7	1	11	1	-6	2
500	26	-2	19	-1	1	2	-2	3
400	47	6	33	2	-16	-4	-1	3
300	50	15	41	7	-31	-8	0	1
250	44	14	33	3	-43	-10	-5	4
200	28	6	16	0	-59	-12	-12	3

*Speed is in knots; winds from the west and south are positive.

Table 2. Climatic Mean Monthly Observed East-West and North-South Winds* (Cont.)

#324 Ubon Ratchathani (15°N, 105°E)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	0	1	0	5	11	-	-8	-2
700	4	0	0	-2	11	1	-8	-1
500	8	0	7	3	1	1	-11	1
300	14	5	13	1	-11	-2	-12	0
200	21	9	19	2	-23	-8	-12	0
150	13	14	16	1	-40	-13	-17	-1
100	6	5	1	1	-52	-9	-22	3

#327 Singapore (1°N, 104°E)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	2	-6	0	-1	6	6	4	3
700	2	-3	-2	1	6	0	3	0
500	-2	0	-5	-1	-6	1	-5	0
300	-11	4	-9	3	-17	-5	-12	-1
200	-19	8	-8	4	-34	-12	-20	-5
150	-23	6	-6	2	-40	-12	-28	-5
100	-8	-1	-8	-4	-13	-3	-12	-2

#323 Bangkok (14°N, 100°E)

850	-5	1	0	3	13	-3	-8	-2
700	-1	0	-4	1	12	-2	-7	0
500	0	-1	3	1	4	0	-9	1
300	9	3	9	2	-8	-4	-12	0
200	11	12	12	4	-25	-9	-14	0
150	12	16	9	3	-40	-13	-30	-3
100	3	4	-1	1	-52	-11	-26	1

#329 Saigon/Tan-Son-Nhut (11°N, 107°E)

850	-7	-4	-8	0	14	0	-3	-2
700	-8	-1	-8	-2	10	0	-4	-1
500	-6	-1	-5	1	1	2	-9	0
300	-3	3	2	1	-11	-4	-11	-1
200	-1	12	7	1	-24	-8	-15	-4
150	-7	16	6	0	-36	-13	-22	-4
100	-9	5	-6	0	-42	-13	-27	0

#326 Songkhla (7°N, 101°E)

850	-15	-3	-8	1	14	2	3	-2
700	-7	0	-8	1	13	-2	0	-2
500	-11	0	-8	1	2	4	-6	1
300	-10	4	-5	2	-15	-5	-11	0
200	-10	12	0	5	-32	-9	-21	-2
150	-13	12	-2	2	-44	-9	-30	-2
100	-12	5	-9	-1	-38	-5	-23	3

#351 Lihue, Kauai (22°N, 159°W)

850	-1	0	-10	-3	-15	-5	-10	-2
700	6	1	-3	0	-10	0	-5	0
500	20	-1	10	-1	1	1	1	0
300	44	-8	32	-1	21	2	13	-1
200	57	-12	57	-1	36	5	23	1
150	51	-11	55	-3	34	6	20	-1
100	32	-6	31	-3	1	3	8	0

*Speed is in knots; winds from the west and south are positive

Table 2 Climatic Mean Monthly Observed East-West and North-South Winds* (Cont.)

*352 Hilo Gen. Lyman (20°N, 156°W)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	-2	3	-7	0	-8	-1	-6	0
700	3	2	-2	-1	-8	1	-4	-1
500	16	0	11	0	2	2	1	-1
300	40	-3	41	0	22	4	18	0
200	50	-8	67	-2	36	4	29	2
150	43	-11	62	-6	32	3	25	1
100	24	-6	32	-2	0	4	9	0

*353 Wake Island (19°N, 167°E)

850	-8	-2	-14	-1	-14	2	-13	1
700	2	-3	-7	-2	-11	1	-11	1
500	14	-5	3	-5	-5	0	-10	-1
300	28	-9	28	-8	6	-3	-3	-2
200	31	-8	44	-9	14	-4	5	-3
150	28	-5	42	-3	15	-6	1	-5
100	16	-1	17	-6	-9	-4	-11	-4

*354 Johnston Island (17°N, 170°W)

850	-9	-2	-11	-1	-18	-1	-13	0
700	-1	-1	-2	-1	-10	0	-7	1
500	10	-5	9	-1	0	1	-4	0
300	30	-10	37	-1	21	3	15	1
200	36	-11	56	2	35	5	30	3
150	32	-11	52	-2	35	5	25	0
100	16	-9	28	-5	2	2	4	-2

*355 Guam (14°N, 145°E)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	-17	-2	-15	-1	-7	3	-8	1
700	-11	0	-10	-2	-8	2	-8	1
500	-10	2	-6	-3	-8	1	-10	-1
300	-3	1	9	-2	-7	-1	-5	0
200	1	6	15	6	-6	-4	-2	1
150	-1	8	13	5	-7	-8	-5	-1
100	-12	9	-2	-1	-19	-5	-19	-1

*356 Majuro (7°N, 171°E)

850	-16	-4	-15	0	-12	2	-8	2
700	-11	-1	-8	1	-13	1	-8	1
500	-16	-3	-2	1	-13	0	-8	0
300	-5	-3	9	3	-9	2	-3	-1
200	-3	5	15	6	-2	2	2	-2
150	-5	2	16	1	4	0	5	-1
100	-15	-5	9	-3	-3	1	-3	-2

*357 Truk (7°N, 152°E)

850	-16	-3	-12	-1	-4	1	-2	2
700	-14	-1	-8	0	-8	1	-5	1
500	-21	1	-8	-1	-11	1	-7	0
300	-14	1	-4	3	-9	0	-6	-1
200	-12	7	-2	8	-10	-4	-7	-4
150	-16	6	-1	3	-9	-6	-6	-6
100	-25	3	-5	-3	-8	-2	-13	-3

*Speed is in knots; winds from the west and south are positive

Table 2. Climatic Mean Monthly Observed East-West and North-South Winds* (Cont.)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850								
700								
500								
400								
300								
250								
200								

#108 Kenai (60°N, 150°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850								
700								
500								
400								
300								
250								
200								

#109 Prompt (60°N, 150°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850								
700								
500								
400								
300								
250								
200								

#110 Yap (10°N, 150°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850								
700								
500								
400								
300								
250								
200								

#111 Ship Alpha (62°N, 33°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850								
700								
500								
400								
300								
250								
200								

#112 Ship Bravo (52°N, 35°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850								
700								
500								
400								
300								
250								
200								

#113 Ship Charlie (35°N, 36°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850								
700								
500								
400								
300								
250								
200								

*Speed in knots; winds from the west and south are positive

Table 2. Climatic Mean Monthly Observed East-West and North-South Winds* (Cont.)

#376 Ship Delta (44°N, 41°W)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	20	4	17	12	15	5	16	2
700	27	6	22	12	17	2	21	0
500	39	11	30	14	23	1	30	0
300	52	10	42	15	27	+2	42	1
200	47	7	41	12	20	+3	37	+2
150	43	5	31	8	22	+5	30	+2
100	30	2	20	3	10	0	21	0

#377 Ship Echo (35°N, 40°W)

mb								
850	17	2	17	7	7	0	6	4
700	29	0	21	7	8	+1	10	0
500	45	+8	30	8	6	+3	15	+1
300	64	+8	40	10	8	+6	25	+1
200	71	+7	42	7	1	+8	29	+8
150	66	+6	36	4	1	+6	22	+6
100	46	+6	29	2	+1	+4	15	+3

#378 Ship Bulls (59°N, 19°W)

mb								
850	5	8	9	2	12	1	11	7
700	7	9	11	2	13	0	13	8
500	13	11	18	2	21	0	23	11
300	23	14	25	1	30	+2	38	12
200	25	10	22	+1	26	+3	33	10
150	26	10	18	+2	19	+1	29	8
100	25	7	14	+2	10	0	21	4

#379 Ship Juliett (52°N, 20°W)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	11	9	6	1	14	+1	14	2
700	15	10	10	1	18	+1	17	7
500	20	12	14	0	24	+2	24	6
300	30	14	22	+1	32	+4	34	6
200	31	10	20	+3	31	+6	35	3
150	29	9	16	+3	23	+3	26	2
100	20	7	11	+2	12	+1	20	1

#381 Ship Mike (66°N, 2°E)

mb								
850	8	4	4	+2	5	4	10	2
700	12	4	7	+2	7	6	16	2
500	18	2	12	+4	12	8	24	1
300	26	+1	17	+6	18	9	37	+1
200	31	+3	17	+7	16	8	38	+3
150	30	+7	15	+6	13	6	32	+3
100	23	+8	12	+7	7	6	26	+4

#382 Ship November (20°N, 140°W)

mb								
850	2	7	+1	2	+6	+3	5	6
700	6	5	4	+1	+4	+2	1	1
500	16	5	12	+2	2	1	8	1
300	37	4	23	+1	14	3	17	1
200	52	+1	22	+1	21	9	24	0
150	46	+4	26	1	19	12	23	2
100	34	+6	26	0	5	8	14	2

*Speed is in knots; winds from the west and south are positive

Table 2. Climatic Mean Monthly Observed East-West and North-South Winds* (Cont.)

#385 San Andres (13°N, 82°W)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	-17	-7	-14	-4	-21	-2	-9	-2
700	-11	-2	-9	-2	-17	1	-6	1
500	-6	1	-4	-1	-14	5	-8	1
300	18	7	10	-1	-3	-1	-6	-2
200	26	16	18	6	4	-2	-3	-3
150	25	12	17	3	4	-5	-4	-3
100	5	6	1	-2	-10	-1	-3	-1

#386 Bogota (5°N, 74°W)

850	-	-	-	-	-	-	-	-
700	-6	2	-5	1	-9	4	-5	1
500	-8	0	-6	1	-18	4	-4	1
300	6	4	-2	4	-14	0	-3	-1
200	14	12	1	8	-6	-11	-5	-2
150	20	5	10	3	1	-8	2	1
100	2	-3	-1	-1	-3	1	3	0

#390 Uccle (51°N, 4°E)

850	11	3	7	-1	10	1	8	2
700	12	0	10	-2	12	1	11	1
500	16	-4	14	-4	18	1	15	-1
300	23	-9	20	-6	24	0	20	-3
200	25	-13	18	-9	25	0	21	-7
150	25	-11	16	-4	20	0	22	-7
100	24	-9	12	-4	12	1	16	-5

#416 Kwajalein (9°N, 168°E)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	-16	-4	-14	0	-13	0	-9	0
700	-13	-2	-7	0	-13	1	-10	0
500	-17	-4	-2	-1	-12	1	-7	0
300	-7	-4	10	2	-5	2	-2	0
200	-4	5	17	6	1	2	3	-1
150	-6	5	18	1	6	0	6	-1
100	-16	-2	6	-5	-3	1	-5	-1

#417 Chihuahua (29°N, 106°W)

850	-1	0	2	2	-2	-1	-2	1
700	12	2	12	7	-5	1	5	4
500	26	3	29	9	-8	0	14	4
300	44	0	48	11	-8	0	30	6
200	44	-1	55	12	-8	-2	36	8
150	41	2	53	11	-10	-3	35	7
100	32	1	38	9	-14	-2	17	2

#422 Empalme (28°N, 111°W)

850	2	0	3	1	-2	-1	-1	0
700	9	0	12	5	-6	0	3	5
500	22	1	29	8	-8	3	12	2
300	43	2	52	13	-10	6	31	5
200	58	4	68	16	-11	3	42	8
150	50	2	62	14	-14	2	37	7
100	36	3	39	10	-16	2	20	2

*Speed is in knots; winds from the west and south are positive

Table 2. Climatic Mean Monthly Observed East-West and North-South Winds* (Cont.)

#439 Essen (51°N, 7°E)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	9	3	9	1	8	2	10	3
700	9	-1	11	0	10	1	13	1
500	13	-6	15	-2	15	2	19	-1
300	19	-12	20	-6	22	2	24	-4
200	20	-12	19	-5	21	1	25	-6
150	21	-10	15	-4	16	1	20	-4
100	21	-9	13	-3	8	2	16	-4

#446 Szeged (46°N, 20°E)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	3	0	5	1	2	-4	5	-2
700	6	-2	8	3	5	-4	7	-3
500	11	-3	12	4	8	-3	10	-6
300	17	-6	19	3	11	-4	12	-9
200	21	-9	22	1	20	0	15	-10
150	24	-9	21	1	24	4	18	-8
100	25	-9	18	1	14	7	17	-5

*Speed is in knots; winds from the west and south are positive